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IRISH STANDARD

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ICS 75.080

75.100

**PETROLEUM PRODUCTS AND USED OILS -  
DETERMINATION OF PCBS AND RELATED  
PRODUCTS - PART 3: DETERMINATION AND  
QUANTIFICATION OF POLYCHLORINATED  
TERPHENYLS (PCT) AND  
POLYCHLORINATED BENZYL  
TOLUENES (PCBT) CONTENT BY GAS  
CHROMATOGRAPHY (GC) USING AN  
ELECTRON CAPTURE DETECTOR (ECD)**

National Standards  
Authority of Ireland  
Glasnevin, Dublin 9  
Ireland

Tel: +353 1 807 3800  
Fax: +353 1 807 3838  
<http://www.nsai.ie>

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EUROPEAN STANDARD

**EN 12766-3**

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English version

**Petroleum products and used oils - Determination of PCBs and related products - Part 3: Determination and quantification of polychlorinated terphenyls (PCT) and polychlorinated benzyl toluenes (PCBT) content by gas chromatography (GC) using an electron capture detector (ECD)**

Produits pétroliers et huiles usagées - Détermination des PCB et produits connexes - Partie 3: Détermination et quantification des polychloroterphényles (PCT) et des polychlorobenzyltoluènes (PCBT) par chromatographie en phase gazeuse (CPG) avec utilisation d'un détecteur à capture d'électrons (DCE)

Mineralölzeugnisse und Gebrauchttöle - Bestimmung von PCBs und verwandten Produkten - Teil 3: Bestimmung und Berechnung der Gehalte von polychlorierten Terphenylen (PCT) und polychlorierten Benzyltoluolen (PCBT) mittels Gaschromatographie unter Verwendung eines Elektroneneinfang-detektors (ECD)

This European Standard was approved by CEN on 14 October 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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**Management Centre: rue de Stassart, 36 B-1050 Brussels**

## Contents

	page
Foreword.....	3
1 Scope .....	4
2 Normative references .....	5
3 Terms and definitions .....	5
4 Principle.....	6
5 Reagents and materials .....	6
5.1 Reagents and materials for the sample preparation (clean-up) .....	6
5.2 Reagents and materials for the GC analysis .....	7
5.3 Standard and reference solutions.....	7
5.4 Base oil .....	7
5.5 Check sample.....	8
6 Apparatus .....	8
6.1 General provisions .....	8
6.2 Gas chromatograph.....	8
6.3 Columns.....	8
7 Sampling and sample preparation .....	8
8 Clean-up procedure .....	8
9 Operating conditions for the GC apparatus.....	9
9.1 Setting up the GC apparatus .....	9
9.2 Injectors .....	9
9.3 Oven temperature programme .....	9
9.4 Carrier gas flow rate .....	9
9.5 Electron capture detector settings .....	10
10 Check on instrumental performance and resolution .....	10
11 Calibration .....	10
11.1 General.....	10
11.2 Determination of experimental relative retention times ( $ERRT_i$ ) .....	10
11.3 Determination of experimental relative response factors ( $ERRF_{i,j}$ ) for PCT .....	11
11.4 Determination of experimental relative response factors ( $ERRF_i$ ) for PCBT .....	12
12 Measurement.....	12
13 Calculation of results .....	13
13.1 Calculation of PCTs .....	13
13.2 Calculation of PCBTs .....	13
14 Calculation of the total content of PCB and PCB related products .....	14
15 Precision.....	15
15.1 General Information.....	15
15.2 Repeatability.....	15
15.3 Reproducibility.....	15
16 Test report .....	16
Annex A (normative) Typical chromatograms.....	17
Bibliography .....	23

## Foreword

This document (EN 12766-3:2004) has been prepared by Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

EN 12766 consists of the following parts under the general title *Petroleum products and used oils – Determination of PCBs and related products*:

- *Part 1: Separation and determination of selected PCB congeners by gas chromatography (GC) using an electron capture detector (ECD)*
- *Part 2: Calculation of polychlorinated biphenyl (PCB) content*
- *Part 3: Determination and quantification of polychlorinated terphenyls (PCT) and polychlorinated benzyl toluenes (PCBT) content by gas chromatography (GC) using an electron capture detector (ECD)*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

**EN 12766-3:2004 (E)****1 Scope**

This document specifies a method of test for the determination of polychlorinated terphenyls (PCT) and polychlorinated benzyl toluenes (PCBT) in petroleum products and related materials by means of a specified gas chromatographic separation procedure. Following the gas chromatographic separation, quantification procedures are described for PCT Aroclor 5442, PCT Aroclor 5460 and PCBT (Ugilec 141).

This document is applicable to unused, used and treated (e.g. dechlorinated) petroleum products including synthetic lubricating oils, to petroleum products and synthetic lubricating oils suitably recovered from other materials (e.g. from waste materials) and to mixtures of vegetable oils.

NOTE 1 This document has been developed as an extension of EN 12766 Parts 1 and 2 to provide a method of determining the total PCB content in accordance with Articles 2, 3 and 4 of EC Directive 96/59/EC [1]. The total PCB content is calculated by summation of PCB content, determined according to EN 12766-2, and PCTs and PCBTs according to this document.

The three classes of materials measured in this standard can be quantified if they occur at concentrations greater than given in Table 1.

**Table 1 — Concentrations for quantification**

Class of material	Minimum concentration	Method applied
PCB, polychlorinated biphenyls	8 mg / kg	(EN 12766-2 – Method A)
	4 mg / kg	(EN 12766-2 – Method B)
PCT	10 mg / kg	(EN 12766-3)
PCBT	5 mg / kg	(EN 12766-3)
Total PCB and related products <sup>a</sup>	25 mg / kg	(EN 12766-2 and EN 12766-3)
<sup>a</sup> This value is only a best estimate. Real field conditions may, depending on the concentrations in the three different classes, result in other, more limited or more improved application ranges. It is the user's responsibility to demonstrate that the analysis has been performed in a valid calibrated concentration range.		

NOTE 2 In order to simplify and rationalize the analytical operations required for an effective, fast and economic inventory of equipment containing liquids classified as PCBs (as defined by Directive 96/59/EC [1]), it is recommended firstly to determine, using an appropriate screening method, the total chlorine content (in mg/kg). Examples for analytical procedures to determine total chlorine content in fresh, used, or treated insulating oils are:

- i) pre-dosed colorimetric kits to measure 25 mg/kg or 50 mg/kg total chlorine (ref: US EPA SW-846 Method 9079);
- ii) electrochemical methods in the range 2 mg/kg to 2 000 mg/kg of total chlorine (ref: DEXSIL<sup>®</sup> L-2000 DXC - US EPA SW-846 Method 9079 and US EPA SW-846 Method 9078);
- iii) wavelength dispersive X-ray fluorescence; or
- iv) oxidative microcoulometry or other scientifically validated analytical methods.

From the total chlorine measured for a specific sample, a theoretical maximum equivalent PCB content can be calculated. When this maximum equivalent PCB content is significantly lower than the limit prescribed by Directive 96/59/EC [1] (50 mg/kg total PCBs) or by local standards (e.g. 25 mg/kg total PCBs), the sample may be considered as "PCB-free".

NOTE 3 When the total chlorine content in a sample is higher than the limits described above, it becomes necessary to proceed with gas chromatographic analysis in accordance with this document using the total chlorine content as:

- i) a guide to establish the level of dilution necessary to operate within the linear range of the ECD detector (EN 12766-1:2000, 10.3.2);

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